

### Letters to the Editor.

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#### Flint Implements from the Cromer Forest Bed.

THE discovery to which this letter relates was made towards the end of September of last year. For the past eighteen months I have spent a considerable amount of time investigating the deposits forming the cliffs of the north-east coast of Norfolk, and have already published a paper dealing with certain humanly fashioned flints found at, and in the neighbourhood of, Mundesley (Proc. Prehis. Soc. E. Anglia, vol. iii., part ii., pp. 219-43). I devoted my attention during last year to the district of Cromer, and have now to record the discovery of a flint-workshop site, which, in my opinion, is referable to the lowermost division of the Pliocene Forest Bed series. As is well known, the Cromer Forest Bed is generally regarded as of Newer Pliocene age, and was laid down after the deposition of the marine Weybourn Crag (latest beds of the Norwich Crag), and before the commencement of the great Pleistocene glaciations. In the Geological Survey memoir, "The Pliocene Deposits of Britain," Mr. Clement Reid states: "Where most complete, the 'Forest Bed' consists of three divisions—an Upper and a Lower Fresh-water Bed and an intermediate estuarine deposit." In many places along the coast the upper portion of the Cromer Forest Bed series can be seen in section towards the base of the cliff, but the lower part, being covered by beach material, can seldom be observed except when a succession of north-westerly gales has caused the sea to scour away the sand and shingle. It is now, however, possible at low water to examine the basal portion of the Cromer Forest Bed deposits when the receding tide has laid bare certain areas which only a comparatively short time ago were covered by great masses of Glacial and other strata in the then existing cliff. The site at Cromer where the humanly fashioned flints dealt with in this letter were found covers an area of foreshore about 150 yards long by 100 yards wide, and is almost opposite the north-western termination of the sea-wall at that place.

The implementiferous horizon is exposed at low water beyond the seaward extension of the shingle beach, and consists of a great number of flints of varying sizes which, for the most part, appear by their coloration and condition to be referable to the well-known Stone Bed occurring beneath the Crag deposits of Norfolk. Associated with these Stone Bed flints are (a) examples of paramoudras, (b) a few quartzite pebbles, (c) very numerous specimens of clay-ironstone pebbles and rolled pieces of chalk (the flint bed in several places rests upon solid stratified chalk which often shows *Pholas* borings in its surface), and (d) small pieces of mineralised bone (Mr. Savin, of Cromer, informs me that two molar teeth

of *Elephas meridionalis* have been recovered from this site), belemnites, and other chalk fossils. Lastly, there are to be found scattered about amongst these relics numerous examples of humanly fashioned flint flakes and implements which generally exhibit upon their flaked surfaces a brilliant and arresting yellow-ochreous coloration. It is to be remarked also that many of the large blocks of Stone Bed flint show upon their surfaces flake-scars which are of the same ochreous shade, and the conclusion is drawn that these large flint masses represent the cores from which the ancient Cromerians obtained the raw material used in the manufacture of their artefacts. The position of the workshop site at Cromer is indicated in Fig. 1, which gives a diagrammatic cross-section of the cliff, beach, and foreshore.

The association upon the limited area of foreshore mentioned above of cores, flakes, and implements of varying sizes would appear to preclude the possibility of these specimens having drifted down the coast from some other site, as the sorting action of the tides would militate against such an association. Moreover, many of the Cromer flints collected do not exhibit marked signs of rolling by water. But the strongest evidence in support of the view that the specimens secured are referable to some period prior

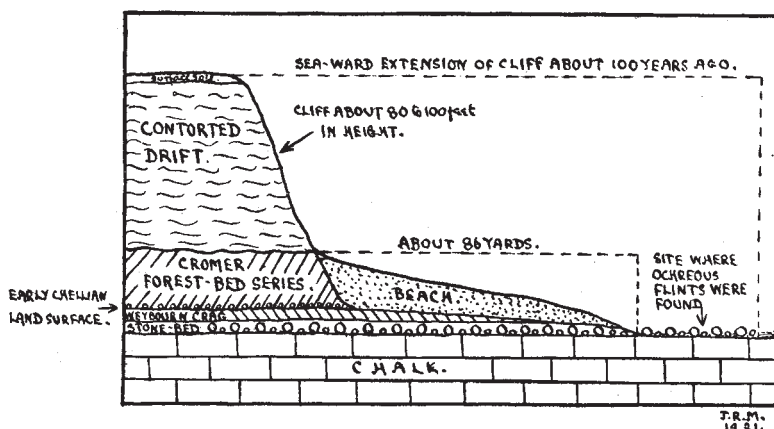


Fig. 1.—Diagrammatic cross-section of cliff, beach, and foreshore at Cromer showing probable relationship of implementiferous horizon to the cliff deposits. (Not drawn to scale.)

to that in which the Glacial deposits forming the Cromer cliffs were laid down is afforded by the fact that the ochreous artefacts have been made almost exclusively from pre-Crag Stone-Bed flints. These latter specimens, often very large and massive, are, to all intents and purposes, sedentary, and have remained so ever since the epoch when they were brought to their present position in pre-Crag times. Thus, when it is realised that many of these large sedentary specimens bear flake-scars exhibiting the same ochreous colour as is to be seen upon the implements and flakes lying near them, it becomes clear that the people who flaked the flints did so at a time when the Stone Bed was exposed, and prior to the deposition of the well-known "Lower Till" and Contorted Drift of Norfolk. And as the coloration of the pre-Crag flints is so markedly different from that of the ochreous specimens, it seems equally clear that the flaking of the latter is not referable to pre-Crag times, but to some later epoch.

I explain these facts in the following manner: After the laying down of the marine Weybourn Crag an emergence of the land took place, and in course

of time the Crag suffered considerable erosion. This erosion in places laid bare the sub-Crag Stone Bed, and it would seem that the land surface then existing was inhabited by the makers of the ochreous specimens, who proceeded to use the large, sound pre-Crag flints in implement-making. In support of these conclusions it may be mentioned that in "The Pliocene Deposits of Britain" (p. 40) Mr. Clement Reid states: "There seem never to be more than a few feet of Crag beneath the Forest Bed." Again (p. 149) he states: "It is not improbable that there may also be another land surface beneath the Lower Fresh-water Bed, for in one place the Weybourn Crag below the Forest Bed has a rather weathered appearance; but of this one cannot be certain." Further (p. 151) it is stated: "The making of trial borings in 1886 and 1888 showed that the eroded surface beneath the deposit [the Forest Bed] was one of the most marked features, and that there was always a more or less gravelly base to the Forest Bed, beneath which the Crag was cut into by numerous channels or hollows."

As patches of Weybourn Crag are still to be seen near the workshop site at Cromer, and as a very careful search has failed to discover any flints of the same order and colour either in the Stone Bed, where it is exposed at West Runton and Sheringham, or in the upper strata of the Cromer Forest Bed series, it is concluded that the ochreous specimens now described are referable to the earliest member of this series, and are represented elsewhere, in all probability, by the "gravelly base" mentioned by Mr. Clement Reid. I have been able to ascertain that the Stone Bed extends for some distance underneath the shingle beach, and, if excavations could be made, would no doubt be found to occur under the cliff itself. The seaward termination of the shingle beach, where the Stone Bed outcrops, is about 86 yards from the foot of the cliff, and it can be regarded as in every way probable that the workshop site, at present exposed, was covered by the cliff one hundred years ago. In fact, the rate of recession of the cliffs to the south-east of Cromer is much in excess of that allowed for in this estimate. All the above conclusions regarding the geological age of the workshop site and the recession of the cliff at this part of the coast are shown diagrammatically in Fig. 1. It would appear that the sea is gradually uncovering and removing many of the ochreous implements and flakes, as to the south-east of Cromer a number of such specimens may be found upon the shore. These examples exhibit marked signs of rolling and the effects of what is known as "beach action."

The first discovery of flaked flints, claimed as being of human origin, in the Cromer Forest Bed was made by Mr. W. J. Lewis Abbott, who published his original paper in *Natural Science* in 1897 (vol. x., p. 89). I have seen Mr. Abbott's specimens, which are of quite a different order from those with which this letter deals. The number of flints recovered from the workshop site at Cromer now amounts to 249, and they comprise cores, half-finished and complete implements of Early Palæolithic Chellean forms, rostro-carinates, choppers, flake implements, racloirs or side scrapers, points, scrapers of ordinary type, and simple flakes. The majority of the specimens are of massive size, and indicate that the people who shaped them were capable of delivering flake-removing blows of great accuracy and strength. One very large artefact, weighing 7 lb. 6 oz., is flaked into the form of a massive rostrate implement, and, if not used in both hands, could have been wielded only by an individual possessed of great strength and size of hand. The occurrence of several examples at the Cromer

site of implements exhibiting flaking upon two opposite surfaces, which approximate in their form to the earliest Chellean artefacts, leads me to regard the whole assemblage of ochreous flints as referable to this cultural stage.

The presence of such an industry in a stratum of, apparently, Upper Pliocene age would seem to be of some interest and importance, and I hope to exhibit the Cromer flints, and to describe them in detail, in the near future.

J. REID MOIR.

Ipswich, January 20.

MR. REID MOIR has submitted sixty of the yellow-stained worked flints from beneath the Forest Bed of the Cromer shore to me, and has asked me to add a few words to his brief report. They are a most impressive collection on account of their abundance, frequently large size, and uniform lustrous surface and orange-brown colour. I have no doubt of their having been shaped by man. Very usually one surface of the flint is a flat orange-brown area produced by a single blow. Others show flaking on both upper and lower surface. Later marginal chipping—subsequent to the ochreous staining of the flint—appears as blue-grey or as black conchoidal scars. Whilst most of the specimens appear to be eminently fitted for use as rubbers in skin-dressing, some show more complete resemblance to coarsely worked ovate implements of Chellean character, and others are distinctly rostro-carinate. The most remarkable among them is the extraordinarily large and heavy rostrate implement weighing 7 lb. 6 oz. It is 10 in. in length and measures 5 in. in breadth and 4 in. in thickness at the butt-end. This huge implement is most definitely shaped by flaking of undoubted human origin. It is almost free from ochreous-yellow stain. Careful drawings of it of the natural size must be published for the use of archaeologists. The whole "find" deserves really accurate illustration by figures giving both the actual size and the natural colour. The cost of such illustration is beyond the resources of our learned societies, but may possibly be met by the generosity of those who have enthusiasm for "prehistorics."

E. RAY LANKESTER.

January 29.

### Modern Pass and Honours Degrees.

ALLOW me to express agreement with the article on "Scientific Education in the Metropolis" in *NATURE* of January 20, p. 653, where you deprecate the premature specialisation of a so-called honours degree under modern regulations, as contrasted with the old plan whereby a pass degree in a great variety of subjects had to be taken before specialisation in one subject was allowed. In the old days all the subjects were compulsory, and the range of knowledge required for Matriculation and for First and Second B.Sc. was quite considerable. A candidate who graduated with credit under those strenuous conditions might fairly be considered educated—to some extent even in the Humanities; and, at any rate, he had a severe training in working at subjects for which he had no special aptitude, but of which he ought not to be ignorant, as well as at those subjects which could be assimilated by him without effort.

I hold that the pass degree system in a modern university, if of a proper standard, as it was and I hope still is at the University of Birmingham, for instance, is generally of far more value to candidates and more helpful to their future development than a narrowly specialised course, which is so much easier.

A man is engaged on his own specialty more or